UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/829,004	04/10/2001	Artur Pedyczak	11014-24/MG	9570

7590 12/19/2002

Micheline Gravelle
Bereskin & Parr
Box 401
40 King Street West
Toronto, M5H 3Y2
CANADA

EXAMINER
NGUYEN, QUANG

ART UNIT	PAPER NUMBER
1636	

DATE MAILED: 12/19/2002

10

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/829,004	PEDYCZAK ET AL.	
	Examiner	Art Unit	
	Quang Nguyen, Ph.D.	1636	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 October 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) *1-4,10,11,14,15,17-19,21 and 22* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *5-9,12,13,16 and 20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 7 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claims 1-22 are pending in the present application.

Applicant's election without traverse of Group II (claims 5-9, 12-13, 16 and 20) in Paper No. 9 is acknowledged. Applicants elected with traverse the species of SEQ ID NO: 9.

Applicants do not argue restriction between the different groups, however, Applicants argue that Applicants do not believe the species election is required because the burden on the Examiner in searching all the species is minimal. Applicants' argument is respectfully found to be unpersuasive because nucleic acid searches of more than 1 sequence is an undue burden on the Office.

Accordingly, claims 1-4, 10-11, 14-15, 17-19 and 21-22 are withdrawn from further consideration because they are drawn to non-elected inventions.

Claims 5-9, 12-13, 16 and 20 are examined on the merits herein.

Specification

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided (see line 6 of the abstract). The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

Claim Objections

Claim 5 is objected to because of the following informalities: the claim is dependent on the non-elected claim 1. Appropriate correction is required.

Claim 7 is objected to because it contains non-elected species.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 9 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 9 is directed to a host cell transformed with an expression vector of the presently claimed invention. Because Applicants intend to introduce the same expression vector into an animal including a human for inducing an immune response and for treating a cancer, the claim encompasses a transformed cell in a human. Since the claimed host cell is not recited as "isolated" or "cultured", the transformed host cell reads on a transformed cell that is part of a human, which is a non-statutory subject matter.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 20 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a method of killing prostate cancer cells in a mammal comprising administering into said mammal an effective amount of a nucleic acid molecule encoding a prostate-specific antigen (PSA) derived peptide according to claim 5, wherein said prostate-specific antigen derived peptide is expressed in said mammal; does not reasonably provide enablement for treating any cancer using a nucleic acid molecule of the present invention as claimed. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

The factors to be considered in the determination of an enabling disclosure have been summarized as the quantity of experimentation necessary, the amount of direction or guidance presented, the state of the prior art, the relative skill of those in the art, the predictability or unpredictability of the art and the breadth of the claims. *Ex parte Forman*, (230 USPQ 546 (Bd Pat. Appl & Unt, 1986); *In re Wands*, 858 F.2d 731, 8 USPQ 2d 1400 (Fed. Cir. 1988)). All of the Foreman factors have been fully considered, with the most relevant factors discussed below.

The claim is drawn to a method of treating cancer comprising administering to an animal an effective amount of a nucleic acid molecule encoding a prostate-specific antigen (PSA) derived peptide that is capable of eliciting an immune response comprising a sequence of the Formula I: Xn-X1-X-X-X-X-X-X-X2 wherein n=0 or 1; each X1 is independently selected from leucine or methionine; each X2 is independently

selected from valine or leucine; and each X is independently selected from any amino acid, and fragments, elongations, analogs or derivatives of the PSA derived peptide.

With respect to the elected invention, the specification teaches by exemplification the nucleic acid sequences of SEQ ID NO:7-12 coding for PSA peptides of SEQ ID NO:1-6, respectively. Applicants further teach that of the six disclosed PSA peptides, 3 peptides having SEQ ID NO:1-3 bind HLA-A0201 molecules on T2 cells, whereas the other 3 peptides containing a binding motif for the gene product HLA-A0201 do not bind to HLA-A0201 molecules on T2 cells. The CLP-312 peptide having SEQ ID NO:3 (encoded by SEQ ID NO:9) is selected as a representative PSA peptide to be injected subcutaneously into A2Kb transgenic mouse to assess the immunogenicity of the HLA-A0201 binding PSA peptide. The results showed that CLP-312 peptide is immunogenic and capable of eliciting an epitope-specific CTL response.

The above evidence has been noted and considered. However, the evidence is not reasonably extrapolated to the instant broadly claimed invention for the reasons discussed below. There are two main grounds of rejection in the following orders: 1) as written the claim reads on any cancer, no matter how it is related to PSA derived peptide; and 2) the term "treatment" involves concepts of prevention and/or curing cancer.

The instant claim encompasses a method for treating any cancer using an effective amount of a nucleic acid molecule encoding a prostate-specific antigen derived peptide of the present invention. The instant specification is not enabled for such a broadly claimed invention because the present disclosure fails to provide sufficient

guidance, including any relevant *in vivo* example (part of guidance), showing that an induction of a host immune response against a prostate-specific antigen would be effective to yield any therapeutic effects for treating any non-prostate cancers. There is no evidence of record indicating or suggesting that any induced host immune response specific for a prostate-specific antigen derived peptide would also recognize and be effective against any non-prostate tumor cells. Nor does the prior art at the effective filing date of the present application provide such guidance. In the absence of sufficient guidance provided by the instant specification, it would have required undue experimentation for a skilled artisan to make and use the instant broadly claimed invention. Additionally, the courts have also stated that a reasonable correlation must exist between scope of exclusive right to patent application and scope of enablement set forth in the patent application (27 USPQ2d 1662 *Ex parte Maizel.*).

With respect to the treatment method of the instant claim, as the term "treating" is well known in the art and treating a disease encompasses producing a useful result, alleviating the effect of a disease, **curing**, **stabilizing**, slowing the progression of a disease and preventing the occurrence of a disease. The instant specification fails to provide sufficient guidance demonstrating that any cancer has been cured or stabilized or any cancer has been prevented in any animal using an effective amount of the nucleic acid molecule of the present invention. There is no reasonable correlation between the results showing that CLP-312 peptide is immunogenic and capable of eliciting an epitope-specific CTL response in an A2Kb transgenic mouse to the broadly therapeutic effects contemplated by Applicants. This is because obtaining therapeutic

effects, particularly for curing or preventing any disease, by genetic vaccination in general remains unpredictable. Leitner et al. (Vaccine 18:765-777, 2000) recently state "Although genetic vaccines have been significantly improved, they may not be sufficiently immunogenic for therapeutic vaccination of patients with infectious disease or cancer in clinical trials" (Abstract, page 765). With the lack of sufficient guidance provided by the present disclosure, it would have required undue experimentation for a skilled artisan to make and use the full scope of the method as claimed.

Accordingly, due to the lack of sufficient guidance provided by the specification regarding to the issues set forth above, the unpredictability of the gene therapy art (specifically genetic vaccine), and the breadth of the claims, it would have required undue experimentation for one skilled in the art to make and use the instant broadly claimed invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 5-6, 8-9, 12-13, 16 and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 5 and its dependent claims, the term "Xn" is unclear. Does n refer to the number of amino acid residues? Then does Xn mean any residue substituted there? Clarification is requested because the metes and bounds of the claims are not clearly determined.

In claim 6, the phrase "substantial sequence homology" is unclear and it renders the claim indefinite. Although the phrase is defined on page 10, line 27 continues to line 3 of page 11, the provided definition in the specification does not set lower limit for "substantial" sequence homology. Therefore, the metes and bounds of the claim are not clearly determined. Also in claim 6, the phrase "a nucleic acid sequence as shown in any one of SEQ ID NOS:7-9" is unclear. Does it mean all of the sequence of SEQ ID NOS:7-9, or does it encompass any two nucleotides (a sequence) from within any one of SEQ ID NOS:7-9? Examiner suggests to use the phrase - - the nucleic acid sequence as shown in any one of SEQ ID NOS:7-9 - - to overcome this rejection.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in-
> (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
> (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

Claims 5-9, 12-13, 16 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Schlom et al. (WO97/35021).

With respect to the elected species of SEQ ID NO:9, Schlom et al. teach the preparation of a vector comprising at least one insertion site containing a DNA sequence encoding a prostate specific antigen oligo-epitope peptide, operably linked to a promoter capable of expression in a host cell, including prokaryotic and eukaryotic cells (pages 13-14). The DNA sequence encoding a prostate specific antigen oligo-epitope peptide contains or comprises or has SEQ ID NO:9 of the presently claimed invention (see SEQ ID NO:5 on page 64). Schlom et al. also disclose a method for inducing an immune response specific to PSA in the rhesus monkey model using a recombinant vaccinia virus containing the DNA sequence encoding a prostate specific antigen oligo-epitope peptide to kill prostatic cancer cells (page 17, lines 17-29). Although recombinant pox virus vectors are preferred, other recombinant viral vectors can be utilized including DNA viral vectors such as herpes virus and adenoviruses, and RNA viruses such as retroviruses and polio (page 15, lines 23-24). Schlom et al. also teach that the encoded antigen can be administered into the host with an adjuvant such as cytokines or co-stimulatory molecules or RIBI Deto, QS21 or incomplete Freund's adjuvant or with a suitable carrier such as liposome (page 17, lines 17-30), and that the recombinant vectors will typically injected in a sterile aqueous or non-aqueous solution, suspension or emulsion in association with a pharmaceutically-acceptable carrier such as physiological saline (line 31 on page 19 continues to line 1 of page 20).

Accordingly, Schlom et al. anticipate the instant claimed invention.

Claims 5-9, 12-13, 16 and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Schlom et al. (U.S. Patent 6,165,460) as evidenced by Schlom et al. (WO97/35021).

With respect to the elected species of SEQ ID NO:9, Schlom et al. disclose the preparation of a recombinant viral vector, preferably a pox virus vector, having at least one insertion site containing a DNA segment encoding prostate specific antigen (PSA) or a cytotoxic T-cell eliciting epitope thereof, operably linked to a promoter capable of expression in the host, to generate a specific humoral and cellular immune response to PSA (see Summary of the invention and the claims). Although recombinant pox virus vectors are preferred, other recombinant viral vectors can be utilized including DNA viral vectors such as herpes virus and adenoviruses, and RNA viruses such as retroviruses and polio (col. 4, lines 43-45). Schlom et al. teach that the recombinant vectors will typically be injected in a sterile aqueous or non-aqueous solution, suspension or emulsion in association with a pharmaceutically acceptable carrier such as physiological saline (col. 7, lines 20-24). Schlom et al. also teach that the encoded antigen can be administered into the host with an adjuvant such as cytokines or co-stimulatory molecules or RIBI Deto, QS21 or incomplete Freund's adjuvant or with a suitable carrier such as liposome (line 54 of col. 5 continues to line 7 of col. 6). A potential prostate specific antigen (PSA) specific T cell epitope (PSA 146-154) that has been determined by Schlom et al. is the sequence K-L-Q-C-V-D-L-H-V (see example II, particularly Tables 6 and 7). A DNA sequence encoding for the aforementioned PSA specific T cell epitope has the same SEQ ID NO:9 of the presently claimed invention as evidenced by

the DNA sequence encoding the same T-cell epitope found in the disclosed DNA sequence encoding a prostate specific antigen oligo-epitope peptide taught by Schom et al. (WO97/35021, see SEQ ID NO:5 on page 64).

Accordingly, the instant claims are anticipated by Schlom et al. (U.S. Paten 6,165,460) as evidenced by Schlom et al. (WO97/35021).

Conclusions

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quang Nguyen, Ph.D., whose telephone number is (703) 308-8339.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's mentor, Gerald Leffers, Jr., Ph.D., may be reached at (703) 305-6232, or SPE, Irem Yucel, Ph.D., at (703) 305-1998.

Any inquiry of a general nature or relating to the status of this application should be directed to LIE, Tiffany Tabb, whose telephone number is (703) 605-1238.

Quang Nguyen, Ph.D.

PATENT EXAMINER